AMENDMENTS TO THE SPECIFICATION

Amend the specification by inserting before the first line the sentence:

The entire disclosure of the prior parent application, application number 10/105,270, filed March 26, 2002, is considered a part of the disclosure of the accompanying divisional application and is hereby incorporated by reference

Page 13, delete the first full paragraph and insert the following paragraph:

In Fig. 1, a furnace 1 used is rotatable round its own axis. More specifically, a frame 12 supporting the furnace 1 is rotated by a motor. Alumina bricks 8 are laid on the frame 12. Silicon carbide bricks ~~11~~ form a side-wall <u>11</u> defining the outer configuration of an ingot of highly durable silica glass of the present invention. The side-wall 11 is surrounded by porous alumina bricks 9 and the alumina bricks 8 for heat insulation. The upper end of furnace 1 is open, and a lid 2 is placed on the upper end edge of furnace 1 with a gap <u>s</u> between the upper end edge of furnace 1 and the lid 2. The lid 2 is made of heat-resistant bricks such as alumina bricks, porous bricks or zirconia bricks. The lid 2 has a hole for fitting the burner assembly 6 therein and a peep hole (not shown).

Page 14, delete the second full paragraph and insert the following paragraph:

A furnace bottom is exposed to heat derived from the oxyhydrogen flame. Therefore zirconia bricks such as ZrO_2-SiO_2 bricks are preferably used as material ~~10~~ constituting the surface of furnace bottom <u>10</u>. However, zirconia bricks are liable to react with molten silica and

sometimes give a cracked ingot or an ingot becomes difficult to separate from the furnace. Therefore the surface of furnace bottom ~~material~~ 10 is preferably covered with heat-resistant zirconia particles (not shown) having a diameter in the range of 2 mm to 10 mm so that a zirconium-containing silica is not directly contacted with the bricks on the bottom and the zirconium-containing silica glass can be easily separated from the furnace. The thickness of the heat-resistant zirconia particles may be varied depending upon the state of the bottom surface, but is usually about 10 mm.

Page 14, delete the fourth full paragraph and insert the following paragraph:

As illustrated in Fig. 2, when a highly durable silica glass ingot having a large size is produced, an auxiliary burner 62 is provided in addition to the main burner assembly 61 in the lid of furnace 1 for giving heat sufficient for extending the molten zirconium-containing silica outward in radial directions. If desired, two or more auxiliary ~~burner~~ burners may be provided.

Page 15, delete the second full paragraph and insert the following paragraph:

The powder feed means comprises at least one powder feed assembly 7. The or each powder feed assembly 7 comprises, as illustrated in Fig. 3, a ~~powder feed~~ first hopper 3 for feeding a powdery material which is the finely divided silica powder or the finely divided zirconium-containing substance or a mixture of the two powders, or a zirconium-containing substance-deposited finely divided silica powder. The ~~powder feed~~ first hopper 3 is oscillated so as to avoid blockage of the hopper with powder. The ~~powder feed~~ first hopper 3 has an opening 30 at the lower end thereof. The size of opening 30 is variable so that the fed rate of powder is

controlled. The powder feed assembly 7 further comprises a rotatable table 31 for receiving the powdery material fed through the opening 30 of the ~~powder feed~~ first hopper 3. On the rotatable table 31, an equalizer 32 for extending and making uniform in height a heap of the powdery material is fitted. There is a gap between the lower edge of equalizer 32 and the upper surface of table 31. The size of the gap is adjustable.

Page 15, delete the full paragraph bridging pages 15 and 16 and insert the following paragraph:

The powdery material fed from the first hopper 3 forms a heap on the table 31, which impinges on the equalizer 32 whereby the heap of powdery material is extended and its height is made uniform. An excessive portion of the powdery material (not shown) ~~is fallen~~ falls from the outer periphery of table 31 into a second hopper 4 for recovery, and then is returned to the first hopper 3. A scraper 33 is provided downstream from the equalizer 32 on the table 31 whereby the powdery material having a uniform height is moved outward along the length of scraper 33 and ~~fallen~~ falls from the table 31 into a third hopper 5. The scraper 33 extends from the vicinity of the center of table 31 to the outer periphery of table 31. The amount of powdery material which falls ~~fallen~~ into the third hopper 5 is monitored by a dotting recorder, and is controlled by varying the length of scraper 33, the rate of rotation of table 31, and the gap between the lower edge of equalizer 32 and the upper surface of table 31. The powdery material which has fallen into the third hopper 5 is fed to the burner assembly 6 shown in Fig. 1. The feed rate of powdery material is usually in the range of 0.1 kg/hr to 10 kg/hr, preferably 0.3 kg/hr to 3 kg/hr.

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Page 22, delete the full paragraph bridging pages 22 and 23 and insert the following paragraph:

As shown in Fig. 6 which is an enlarged schematic view illustrating growth of zirconium-containing silica glass, a powdery material ~~is fallen~~ falls through in a tube ~~113~~ 117 into a plasma arc-coupled region where a plasma arc 114 generated by the plasma torch 106 and a plasma arc 115 generated by the plasma torch 107 are coupled. The zirconium-containing silica [is] further falls ~~fallen~~ to impinge upon the rotating target 108. Thus, a zirconium-containing silica glass ingot 116 is formed on the target 108.

Page 23, delete the second full paragraph and insert the following paragraph:

A current of 100 to 500 amperes at a voltage of 50 to 250 V is applied to each of plasma ~~arc~~ torches ~~114~~ 106 and ~~115~~ 107. An argon gas is preferably supplied at a flow rate of 10 to 60 liter/min through each of plasma ~~arc~~ torches ~~114~~ 106 and ~~115~~ 107. The rate of mixed powder (quartz powder plus metallic zirconium powder) supplied is usually in the range of 0.5 to 20 kg/hour.

Page 23, delete the third full paragraph and insert the following paragraph:

Fig. 7 is an enlarged partially sectional view of a plasma anode torch 124 used in an apparatus using plasma melting method. In Fig. 7, the plasma anode torch has an electrode 120 exhibiting no ignition loss. The electrode 120 is made of copper or other metal exhibiting no ignition loss. The electrode 120 has a coaxial tube 121 therein. Cooling water flows through the tube 121 in the direction of arrow and flows back through the space between the tube 121 and the

electrode 120. Plasma gas flows around the electrode 120 in the direction of arrow 123 and forms a plasma arc ~~124~~ 131 which is ejected through a nozzle 125.. A nozzle assembly 127 cooled with cooling water circulating therein has a function of limiting the plasma gas around the electrode 120. The nozzle 125 is electrically insulated by an insulating member 129 from an electrode assembly 128. The round end of the electrode 120 ensures an arc route and enables high-electric current passage and gives enhanced service life. Abrasion of the inner wall of the nozzle 125 is minimized and the contamination of zirconium-containing silica glass also is minimized by the round end of electrode 120.

Page 25, delete the first full paragraph and insert the following paragraph:

In Fig. 9 which is a partly sectional elevation of another apparatus using the plasma melting method, a hopper ~~110~~ 130 is charged with a powdery material which is a mixture of a finely divided silica powder and a finely divided zirconium-containing substance, or a finely divided silica powder having deposited thereon a finely divided zirconium-containing substance. The hopper 130 is connected to a constant-rate feeding means 112, a connecting tube ~~114~~ 119 and a powdery material feeding tube ~~116~~ 132. The powdery material is supplied from the hopper ~~110~~ 130 through the feeding means 112 and the connecting tube ~~114~~ 119 into a melting vessel 118 within a furnace ~~120~~ 160. The position of melting vessel 118 can be shifted in the vertical direction and in the horizontal direction.

Page 25, delete the full paragraph bridging pages 25 and 26 and insert the following paragraph:

A twin plasma torch comprising a plasma anode torch 124 and a plasma cathode torch 126 is arranged in a manner such that the two plasma torches are symmetrically inserted in the furnace ~~120~~ 160 relative to a plasma arc-coupled region ~~122~~ 133. The torch angle and the depth of the plasma torches can be controlled. The plasma anode torch 124 and the plasma cathode torch 126 are inclined preferably to an extent such that an inclination angle from the perpendicular axis is in the range of 45 to 65 degrees and the distance in the horizontal direction between the lower ends of the two plasma torches is in the range of 50 to 100 mm. The plasma anode torch 124 has the same structure and function as those explained above in detail with reference to Fig. 7 as to the first embodiment. The plasma cathode torch 126 has the same structure and function as those explained in detail above with reference to Fig. 8 as to the first embodiment.

Page 26, delete the second full paragraph and insert the following paragraph:

The ceiling part of the furnace ~~120~~ 160 is flat and can be cooled by cooling water circulating therein. Silica vapor volatilizing from the molten silica in the melting vessel 118 flows upwardly and is exhausted through outlets 156 provided in side-wall.

Page 26, delete the full paragraph bridging pages 26 and 27 and insert the following paragraph:

Prior to an operation, the bottom surface of the melting vessel 118 is covered with silica particles having a large particle diameter at a thickness of about 1 cm to about 20 cm. The melting of the powdery material is effected in a plasma arc-coupled region 122 where plasma arcs generated from the plasma anode torch 124 and the plasma cathode torch 126 are coupled together to give heat sufficient for melting the powdery material. In an initial stage, the angle and position of the plasma anode torch 124 and the plasma cathode torch 126 are adjusted while the melting vessel 118 is rotated at a predetermined rate. The powdery material ~~is fallen~~ falls through the plasma arc-coupled region 122 to form a small heap of partly melted zirconium-containing silica on the center of the bottom covered with silica particles. The powdery material ~~is~~ continually ~~fallen~~falls, while the adjustment of angle and position of the plasma anode torch 124 and the plasma cathode torch 126 are continued, to enlarge the heap of partly melted zirconium-containing silica. With an increase of the heap of partly melted zirconium-containing silica on the bottom covered with silica particles, the vessel 118 is downward moved so that the heap of partly melted zirconium-containing silica is maintained at a temperature sufficient for keeping a molten state. The molten zirconium-containing silica has a high viscosity and is of a mountain-shape having an outward extended circular foot. The molten zirconium-containing silica is maintained at a high temperature so that the silica is well extended to the side–wall of melting vessel 118. More specifically a stream of plasma generated by the twin plasma torches 124 and 126 covers the entire exposed surface of the mountain-shaped zirconium-containing silica whereby the molten material is extended to the peripheral side-wall to give an ingot wherein zirconium is uniformly dispersed in a silica glass matrix.